

Evaluation of competitive advantages of regional economic clusters

Evaluación de las ventajas competitivas de los clústeres económicos regionales

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Contents

- [1. Introduction](#)
- [2. Literature review](#)
- [3. Materials and methods](#)
- [4. Discussion](#)
- [5. Conclusions](#)
- [Bibliographic references](#)

ABSTRACT:

For the formation of clusters at the regional level should consolidate efforts of government, business and science. This process requires the systematization of scientific knowledge about clusters, their characteristics, development stages and peculiarities of territorial distribution in terms of a long-term development prospects of the region. A separate problem is the need to investigate the conditions, activities and instruments of formation of competitive advantages of the cluster.

Keywords: cluster, competitive advantages, region

RESUMEN:

Para la formación de clústeres a nivel regional se deben consolidar los esfuerzos del gobierno, los negocios y la ciencia. Este proceso requiere la sistematización del conocimiento científico sobre los clústeres, sus características, etapas de desarrollo y peculiaridades de la distribución territorial en términos de las perspectivas de desarrollo a largo plazo de la región. Un problema aparte es la necesidad de investigar las condiciones, actividades e instrumentos de formación de ventajas competitivas del clúster

Palabras clave: clúster, ventajas competitivas, región

1. Introduction

Clusters are geographically concentrated groups of interconnected companies, specialized suppliers, service providers, firms in related industries, as well as related to their work organizations (e.g., universities, standards agencies, trade associations) in certain areas, competing, but leading the joint work. The main difference from the cluster, territorial-production complex is the fact that the cluster is a cluster in contact with each other independent firms in the same industry or sub-industry.

There are the following main characteristics of economic clusters:

- The geographical proximity of enterprises. Firms concentrate on a certain area on the basis of the obvious benefits of this location. In addition, usually, clusters are formed into new, undeveloped areas and develop existing ones.
- A wide range of participants. Along with manufacturing businesses in the cluster include educational, research and public enterprises.
- The links between participants. Cluster can not be called a simple cluster of firms in the same geographic area. Among the participants have to form information flows, for which there is a rapid spread of innovation.
- The presence of innovative component in the production technology. The most effective and successful clusters are created where possible technological breakthrough in production technology and expansion into new market niches. In this regard, many countries have increasingly used "cluster approach" in the formation and regulation of its innovative programs.
- High role of human capital in the development of the industry.

The main purpose of the creation and development of clusters is to increase the competitiveness of regions and the country as a whole, and as a result, increase the overall standard of living of the population.

The most effective clusters are developing in those sectors where we can create higher value added. Such industries include: new, high-tech industries, industries, consumer-oriented or in the service sector. Also, the most efficient to create a cluster from scratch, and on the existing basis.

Clusters vary in size, breadth of coverage and level of development. They can be established and developed within the same region, and in several adjacent regions or even countries. The level of development it can be a lot of small firms and enterprises, that are linked by horizontal connections and relations, as well as a few major players.

2. Literature review

Theoretical and methodological basis for the research consists of the works of domestic and foreign scientists in the field of cluster theory of economic development, and improve governance and competitiveness.

Comparative advantages of cluster formations determined by the laws of international trade in the framework of the theory of absolute advantages of A. Smith, the theory of the relative advantages of D. Ricardo and the theory of supply factors of production E. Heckscher and B. Ohlin.

In the field of creation and development of the cluster theory of regional economic development interesting work of M. Porter, M. Enright, and Russian scientists, including A.N. Asaul, A.V. Yermishina, A.M. Kolin, J.N. Lapygin, I.V. Pilipenko, T.V. Uskova, I.S. Ferova, T.V. Tsikhan, etc.;

In research on the formation and governance of integrated structures it is necessary to highlight the work of A.V. Kretinin, A.I. Novikov, I.G. Ushachev, A.V. Chayanov and others.

Questions of creation of vertically integrated structures of the complexes discussed in the writings of N.A. Belyakova, I.V. Zhukova, A.A. Mokrushin, O.Yu. Novikova, N.V. Yagodina, etc.;

In the field of improving the competitiveness of the elements of the integrated structures, companies and regions are researched by N.A. Ivanova, L.P. Dashkov, N.S. Yashin, etc.

3. Materials and methods

Theoretical and methodological basis of research served as the conceptual provisions of the fundamental works of foreign and domestic scientists on various aspects of the cluster approach, economic forums, conferences, the development of the individual authors.

When studying the problem used different methodological approaches, including systemic and normative, which allowed us to explore the properties of industrial clusters.

During the study applied a number of General scientific and special research methods, among which the methods of statistical multivariate analysis, multidimensional classification, cluster analysis, simulation, expert forecasting, factor analysis.

Information and the empirical base of research made: legislative and regulations of the Russian Federation, official data from Federal and regional bodies of state statistics of the Russian Federation; Federal and regional programs of socio-economic development; information resources on the Internet; own research of the author.

Theoretical and practical significance of research results is the development of the possibilities of using the cluster approach to enhance competitiveness of the regional economy, which can be applied in the activities of regional authorities in developing strategies for development; the region as a market alternative to traditional approaches in the search for sources of economic development. In addition, the results of the study are of particular importance for individual companies in the development of integration processes in the sectoral and territorial economic complexes.

4. Discussion

4.1. Development of The Most Important Competitive Advantages of Regional Economic Clusters

As points of economic growth, the cluster has advantages, which determine the competitiveness of the Federal district and the state on the world market, as well as determine the region's place in the market of investment resources, the main directions and principles of interaction at the national and international markets. Competitive advantages obtained by members of clusters are determined by the aggregate inherent in such forms of spatial localization of the comparative and absolute advantages.

Absolute advantages are less costly on a unit of production compared with other economic entities. A. Smith explains the advantages in international trade: "If another country can supply us with a commodity cheaper than we know that the cost of its production, it is best to buy this product, giving him some portion of the product of our productive forces, used in the case in which we have some advantage" (Kireev, 2006).

In the framework of the theory D. Ricardo comparative advantages arise because of the difference in technological development between countries, and, more precisely, the difference in the development of the factors of production, and identified by comparison of the relative costs of production. Thus, the comparative advantages of the country that producing a unit of product spends less productive forces than the other.

According to the Heckscher-Ohlin model, namely to ensure the country's factors of production (labor, raw materials, capital, information) and the proportions in which they are used in the production of various commodities, and determines comparative advantage. So, the country is more profitable to export the product, which uses the relative abundance of (cheap) production factor and import Vice versa - the goods scarce (expensive) factor of production. All these laws have a place in today's global market, with certain deviations and transformations.

In General, under the absolute advantage will consider the resources (material, infrastructure and other) that characterize an entity, including an innovative point of view, and allowing him to produce the product with relatively minimal cost. And the relative benefits of assuming the alternative definition of value, calculation of lost opportunities, that is, relatively fewer resources per unit of one commodity expressed in resource costs per unit of another commodity (Chueva et al., 2016). The main criterion for the separation of absolute and relative advantage is seen in the availability of resources (or deemed lack of effort on their receipt) or, respectively, relative costs, aimed at the mastery of these resources (Porter, 2000). Different economic agents, be it firms, regions, States in the competition distinguishes the level of these efforts.

In modern market conditions the competitive advantages are formed based on the

characteristics of the location of the region (development of transport, engineering, research and innovation infrastructure, logistics and advantageous location close to major markets, suppliers, etc.), i.e. due to the fact that partly defines infrastructure support cluster formation.

It should be noted that the fundamental difference between competitive advantage comparative is the possibility of investing in innovations to extract innovation rents economic entity is quasi-rent. This concept was first used by A. Marshall to refer to income derived from "man-made machines, and other instruments of production" (Marshall, 1993).

J. Schumpeter used the term "quasi-rent" to describe the non-equilibrium income in the short term from the "new means of production reduce labor costs" (Schumpeter, 1982). Maximize the competitive advantages of business entities possible in the framework of competitive clusters.

4.2. Synergy and Regional Economic Cluster

Regional economic cluster enables you to maintain the advantage due to the gradual strengthening of internal relations: entities of the cluster to invest in specialized, but related technologies – in information, infrastructure, human resources, leading to mass emergence of new companies and new knowledge. And innovative component products will ultimately determine the competitiveness of an economic entity producing it. This is the main difference of competitive advantages from comparative. Moreover, the product portfolio of a regional cluster it is possible to allocate the production of the core, the core product is innovative, offer greater added value, and for export, as well as adjacent or co-production whose products sold on the domestic market (region, country, cluster).

It is important to note that in Russia is quite low added value in manufacturing industry is 196,4 billion, equivalent of 2.25% of the global figure of 17.6% of GDP (Gross Domestic Product). Russia is behind the US, China, Japan, Germany, Italy, UK, France, South Korea, and the level of per capita ahead of her an even greater number of countries. While the annual growth of value added in agriculture was 4.6% in 2006-2008, higher than in any OECD (Organisation for Economic Co-operation and Development) country, except Israel, Sweden and Slovakia. Therefore, the advantages of cluster formations will help to develop innovative activities of economic entities of manufacturing industries.

In the long term, the advantage of cluster formations is seen in "the ability to broadcast their own condition, such as productivity, efficiency, innovativeness, competitiveness, higher levels of economic systems" (Boush, 2011): a separate entity in the structure of a regional cluster of subjects related to industries involved directly or indirectly in the technological process of production of the final product of the cluster.

4.3. Relative and Absolute Benefits of Economic Clusters at The Levels of The Market

Analyzing regional economic clusters, it is logical to distinguish between comparative (relative and absolute) advantages in the region (region, Federal district), national (domestic) and international (external) markets as at each of these levels, the task of the state economic policy is seen in the support convert the comparative advantages of cluster formations in competitive. In other words, to institutionalize a "framework conditions", business of formation of the innovative component in the activities of the cluster members as a resource for their subsequent activities.

In carrying out its activities within the cluster, the entity has a greater capacity and a higher degree of motivation compared to other market actors in the region to gain competitive advantage, therefore, competitiveness. Under the competitiveness we understand the ability of a particular object or entity to meet the needs of the stakeholders in comparison with other similar subjects and/or objects.

The competitiveness of economic entities – participants of the cluster forms the specific ability of the cluster to meet the needs of internal and external environment, in other words

to adapt. The competitiveness of economic clusters suggests the possibility of rivalry of its member economic entities not only on the domestic (national) market, but also on the outside.

Economic clusters are full participants in international trade, having both relative and absolute advantages. The cluster occupies a marginal position in the international division of labor between the country and the region. It should be noted that in the international market competition between countries based on comparative advantages, while the competition between the regions - on the absolute benefits due to the high mobility of most factors of production. The region, unlike countries may not find their specialization in interregional division of labor, if he has only a comparative advantage (Pilipenko, 2006).

By reducing regional competitiveness (resulting in loss of productivity, loss of enterprises in the markets, thus reducing income population and quality of life), regions and economic clusters, unlike countries, are deprived of the opportunity to use instruments of monetary and customs-tariff policy, so they can compete in the foreign market, having innovative resources of constituent entities of the cluster. It is important to note that the comparative advantages of the region will become the basis of clusters of competitive advantages of economic entities included in the cluster.

Analyzing the absolute and relative advantages of the economic cluster, it is necessary to pay attention not some similarities with the intra-industry and inter-industry competition. If in the first case we are talking about the fight for the consumer, the second is for resources.

Study of regional economic clusters in the Russian Federation. Certain similarities can be observed when considering the advantages of cluster entities at the regional, national and international markets. The region, Federal district struggle between economic clusters occurs over resources (often higher wages of the companies of the cluster leads to a "pumping" of labor resources, more advanced technologies are also "working" on the cluster, brought quasi-rents income, etc.).

At the national level the struggle between identical clusters already takes place for the consumer. For example, it will be possible to observe competition between the Verkhnekamskoe and Gremyachinskoe deposits, Perm and Volgograd mineral and chemical clusters, etc. this is Partly true for the international market.

Thus, if we consider an economic cluster whose products are oriented not only to the domestic market, the structure of absolute and relative advantages is as follows (Figure 1).

Figure 1
Relative and Absolute Benefits of Economic Clusters at Market Levels

Absolute benefits Resources	Relative benefits Cluster schemes of cooperation	Regional Market (Region, Federal District)	
Absolute benefits		Relative benefits Investment and institutional conditions of the region	National (Domestic) Market
Absolute benefits		Relative benefits State policy	International (External) Market

Source: Prepared by the authors.

Absolute advantages of the subsequent level (regional level - national level - international level) constitute both groups of advantages of the previous level as a result of carrying out the state economic policy (regional and federal accordingly), i.e. on the external market, the competitiveness of regional clusters defines an expanded number of absolute advantages. In other words, at the national level, the advantages of cluster education determine the advantages of the region.

Among the absolute advantages of a cluster in the regional market (competition between clusters of one region), one can include resources (unique, natural, etc.), privileged access to production factors or a specific asset of the cluster (Asyaeva, Kobersy, Guseva, & Khakimov, 2017). For example, in Finland, there is a powerful sector of scientific developments for the telecommunications cluster, such as Germany is an administrative resource (state purchases) for an automobile cluster, in China are a qualified workforce for a cluster of mobile communications, in India are investment resources of transnational companies.

Absolute advantage of forming, for example, mineral-chemical and agro-industrial clusters in the Volgograd region identified natural resource component – a unique potash deposits, and climatic conditions for agricultural production development.

Unlike the identical cluster in the Perm region, the absolute advantage of the Gremyachinskoye deposit in the Volgograd region is the more advantageous location in the South of Russia from a logistic point of view near the Black Sea port, where EuroChem Group AG has built the Tuapse Bulk Terminal in 2011. It is a high-tech complex for transshipment of mineral fertilizers. This will make it possible to supply potash fertilizers both for export and domestic market to domestic agricultural producers and companies engaged in the production of complex fertilizers under the most competitive conditions.

Comparative advantages in the regional market to form a “cluster scheme of cooperation” (Nosov, 2010) between the enterprises of small and medium business at the regional level:

- ability to achieve economic effect in the organized training of the personnel;
- efficiency of procurement of technical means and software products information technology;
- access to orders (customers);
- transfer positive reputation of the cluster to its members (brand);
- adaptability of the vocational education systems of the region (funded budgets) to the needs of the cluster enterprises;
- interests of the cluster in the implementation of the region's innovation and other programs.

Benefits of Cluster Formations. As a result, opportunities for creating competitive advantages, presented in table 1 for various levels of a competitive environment.

Table 1
Opportunities for Creating Competitive Benefits (Ivanov, Annenkova & Ponomareva, 2009; “Models of the organization of regional...”, 2008).

Level	Opportunities
Level of the individual firm	<ul style="list-style-type: none"> – low cost of starting a business; – significant reduction of barriers to entry to the market through the harmonization of requirements within the cluster.
Inter-firm level	<ul style="list-style-type: none"> – reduction of transaction and transport costs; – development of related industries and manufacturers of related equipment; – established sustainable system of dissemination of new technologies, knowledge, products (technological chain) and other positive externalities; – joint financing of public resources; – higher level of innovation activity of economic entities; – flexible entrepreneurial structure (small and medium enterprises – innovative points of growth); – formation of a dynamic network structure.
	<ul style="list-style-type: none"> – higher degree of access to state institutions and public goods;

Level of regional external environment	<ul style="list-style-type: none"> - development of specialized resources, primarily human capital; - development of support sectors: engineered materials, services, infrastructure; - development of specialized institutions: education, scientific-technical, research, marketing, Finance, design, etc.; - innovation infrastructure; - low Agency costs: financing region-enterprises and clusters at the level of local credit institutions and venture capital funds; - support local and regional development programs.
Level of international external environment	<ul style="list-style-type: none"> - inflow of foreign investment through clear to investors the sectoral specialization of the region; - creation of a regional high-tech enterprises of the opportunities of access to world markets through foreign partners and international cooperation; - influx of specialized labor from other regions.

Source: Prepared by the authors.

Thus, the advantages of cluster formations derive from the essential characteristics of the cluster and the determined set of conditions, resources and factors necessary for the formation and effective functioning of such structures (Buyanov, M. E. & Volov, 2011), that is, the cluster potential of the region according to their level, for example, in the Volgograd region is second only to the Rostov region among the regions of the SFD (Southern Federal District). As a result of transformation of comparative advantages at the regional level, formed an absolute advantage in the domestic market.

However, the relative advantages directly depend on the institutional and investment conditions of the region (Ketels, Lindqvist & Sölvell, 2012). Formation of competitive advantages in conditions of underdevelopment of the institutional environment, investment conditions and mechanisms of the Russian economy is most effective if the connections between the cluster members are of a vertical nature. To date, the vertical links of economic entities give them the opportunity to select priority areas for cooperation and cooperation at the expense of large size and influence, and create opportunities for a more stable and competitive position in the domestic market.

From the point of view of innovation, vertical links have several advantages. Firstly, it can accelerate the coordination of additional investments through the exchange of investment plans, which will accordingly reduce some of the uncertainties associated with innovation. In Russia, this is especially applicable, since improved integration of the technological cycle, combining the research potential of industry research institutes, the industrial potential of industrial enterprises and the capital of financial institutions, can lead to closer and longer ties between enterprises of the regional cluster. As a result, it is possible to predict active processes for the implementation of the innovative potential of the cluster and the region as a whole.

Secondly, in conditions of poorly developed financial markets and instruments, companies have the advantage of access to domestic finance. They can redistribute finance from enterprises that have a positive financial balance in favor of enterprises with negative balance or develop several alternative innovations in parallel and finance them through successful commercially unsuccessful projects, have the opportunity to implement large-scale, capital-intensive, innovative projects and can conduct multidisciplinary research, uniting researchers and experts from various industries.

Thirdly, business entities have the opportunity to transfer technology between production lines and their associations in order to create new products.

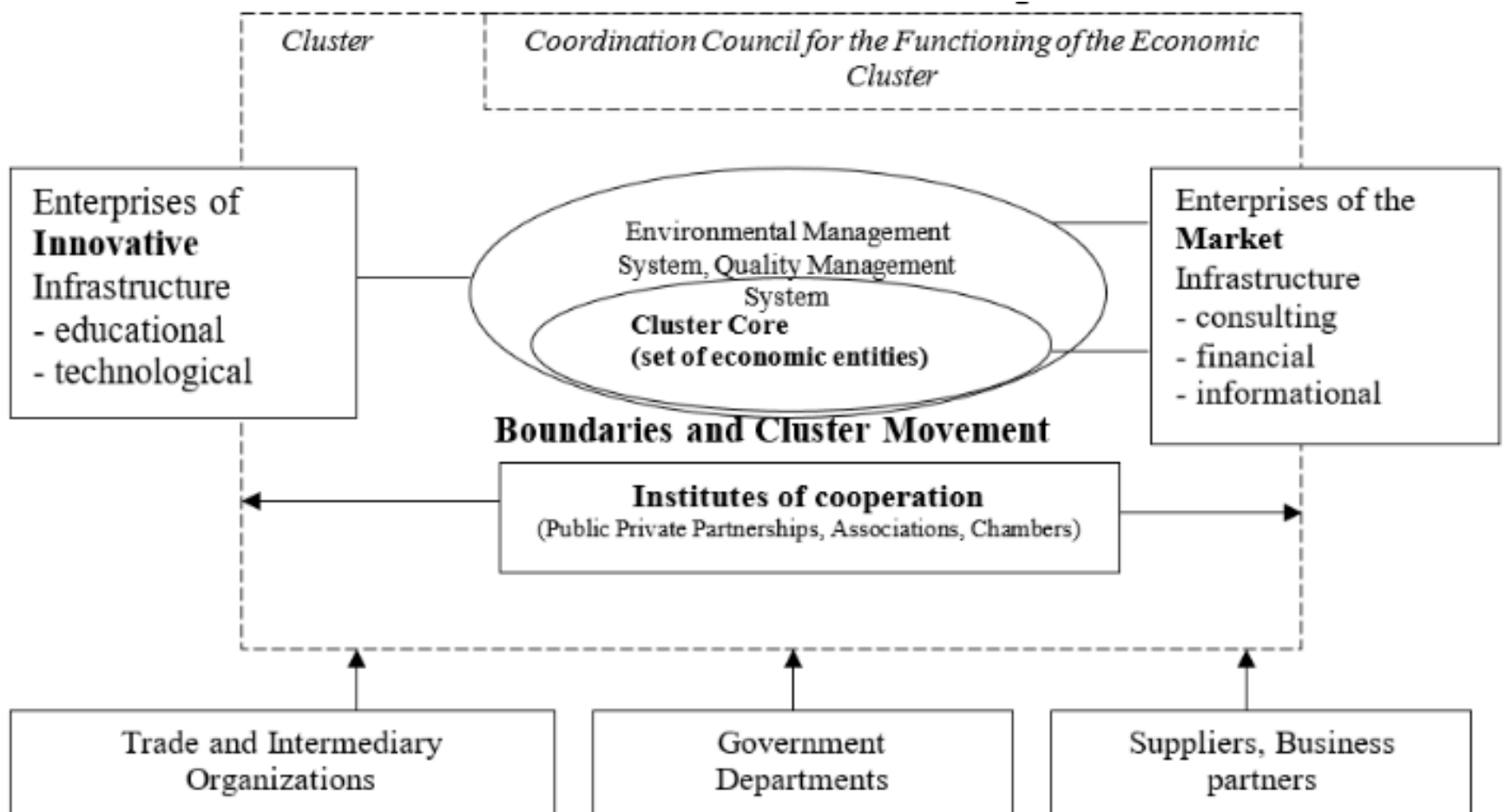
Thus, the comparative advantages of cluster formations form the following competitive advantages for the regional economy (Nosov, 2010):

- increase in the number of taxpayers and the taxable base, an increase in budget revenues;
- increase in the flow of direct investment, the mass of borrowed funds (including due to deferred payment), accelerated working capital, the integration of financial opportunities within the cluster;
- growth of the region's competitiveness, reduction of barriers to entry into international markets;
- flow of qualified specialists;
- development of related sectors in the economy and services;
- diversification of economic development of the territory;
- accelerated adaptation to new market conditions, minimization of transaction costs;
- growth in the profitability of shares in cluster companies;
- improvement of the social infrastructure of the region within the framework of social responsibility of business, which is important, as according to the rating agency "Expert RA", according to the rating of social sustainability in particular, the Volgograd region belongs to the group of deep decline;
- increase in employment of the population and overall improvement of the quality of life of the population of the region.

4.4. Author's Model of An Economic Cluster at The Regional Level

The comparative advantages of the economic cluster in the regional, national and international markets, which are typical for cluster formations in general, allow us to form an idea of the cluster model as an effective mechanism for the formation and realization of the region's competitive advantages (Figure 2).

Figure 2
Model of an Economic Cluster at the Regional Level



Source: Prepared by the authors.

According to this model, the core of the cluster is represented by the leading companies in the region, implementing competitive advantages, and risk diversification and distribution of financial instruments, applying the strategy of greening and standardization of products (Müller, Lämmer-Gamp, Meier zu Köcker & Christensen, 2012).

Cluster management should be carried out by the relevant body – the coordination Council with administrative functions, legal and economic levers. The coordinating Council operates through the underlying company of the cluster, and controlled the entire program of cluster development (the Board may consist of Directors of companies in the cluster). The Council solves the problems associated with retraining of personnel, consulting, investment portfolio, deals with the problems of quality, logistics, information technology. However, it should be emphasized that the coordinating Council is a purely Advisory body. A consortium of partners in the cluster is assigned the cooperation agreement and is managed by the cluster meeting without creating any additional structures (Chusovskoy, 2009).

The main institutions cooperation cluster is represented by trading-intermediary organizations, enterprises - suppliers and business partners, and public authorities that implement the mechanisms of the investment, institutional, legislative support cluster formations in the region.

5. Conclusions

Thus, they considered the benefits of economic clusters contributing to the competitiveness of business entities that are formed under the influence of conditions, resources and factors of production in the area. We can draw the following conclusions.

First, the absolute benefits of each successive level (regional level – national level – international level) represent a set of comparative advantages of the previous level as a result of the state economic policy (regional and Federal respectively), i.e. at the national level, the advantages of cluster formation define the benefits of the region.

Secondly, mainly comparative advantages to form a competitive advantage of the cluster. On the regional market it is due to the opportunities provided by cluster cooperation schemes, internal cluster processes of cooperation and competition between members of the cluster: the joint contracts and transactions, training of personnel, information exchange, co-financing, logistics operations, procurement of technical means and equipment (hence lower transaction and transport costs, elimination of losses of the technological process, the low costs of starting a business, lowering the barriers to market entry, a great opportunity to increase market share).

At the national level, the absolute benefits depend on the benefits at the regional level, and the relative institutional and investment conditions of the region (access of cluster members to state programs, the use of public-privet partnership, the development of specialized institutions, objects of innovative infrastructure), the lack of development which leads to increased vertical linkages of entities in the formation of competitive advantages.

At the international level, the relative advantages of local clusters compared to the cluster structures of other countries determined by the policy of the state towards reducing the barriers of entering the international market and create favorable climate for attracting foreign investment as well as the possibilities of economic entities-participants of the cluster to transform comparative advantages into competitive through the organization of activities according to international standards and obtaining the appropriate certificates for the products and business processes (the international management standards ISO, environmental standards, quality standards), the strengthening of the brand of the cluster and increase its value, the implementation of an environmental management system that contributes to strengthening the competitive position in international markets.

Third, for sustainable growth of cluster formations require an active role of the state in the process of converting comparative advantage to competitive with the aim of increasing the competitiveness of economic entities in the cluster, the support and development of the leading actors of the region within the framework and context of economic clusters.

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[Índice]

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